

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

WATER AND SEDIMENT CONTROL BASIN, (NUMBER)

Code 638

DEFINITION

An earth embankment or a combination ridge and channel generally constructed across the slope and minor watercourses to form a sediment trap and water detention basin.

PURPOSE

To improve farmability of sloping land, reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff, and improve downstream water quality.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to sites where:

1. The topography is generally irregular and precludes installing and farming terraces with reasonable effort.
2. Watercourse and gully erosion are a problem.
3. Sheet and rill erosion are controlled by other conservation practices.
4. Runoff and sediment damage land and improvements.
5. Soil and site conditions are suitable for installation with the predominant land slope at the basin not steeper than 18 percent.
6. Adequate outlets are available or can be provided.
7. The basins are part of a resource management system.

Water and sediment control basins shall not be used in place of terraces. Where a ridge and/or channel extend beyond the detention basin or level embankment, standards for Terrace (600) or Diversion (362) must be applied as appropriate.

CRITERIA

General Criteria. Water and sediment control basins can be part of the treatment needed to protect the soil resource base. In addition, practices such as terraces, contouring, a conservation cropping system, conservation tillage, and crop residue management shall also be used to control erosion.

The resource management system must reduce soil loss in the interval above and below the basin to prevent excessive maintenance and operation problems.

Spacing. Water and sediment control basins shall generally be spaced at terrace intervals. The grade of the watercourse between basins shall be considered, and the spacing shall be set to prevent watercourse or gully erosion. The uncontrolled drainage area of each basin shall be limited to 50 acres so duration of flooding, infiltration, or seepage does not damage crops or create other problems.

The system of basins and row arrangements shall be parallel when possible and spaced to accommodate farm machinery widths. Consideration shall be given to embankment slope lengths, top width, and inlet location when determining spacing.

Alignment. The embankment orientation and row direction shall be approximately

perpendicular to the land slope to permit contouring as near as possible. The arrangement should permit farmability without excessive point rows or sharp curves. Field boundaries and row length should also be considered when determining basin location and row direction.

Cross-Section. Embankment slopes shall not be steeper than 2 horizontal to 1 vertical (2 : 1). The effective top width shall be at least as wide as shown in the following:

Fill Height (Feet)	Effective Top Width (Feet)
0 – 5	3
5 – 10	6
10 – 15	8

The constructed height of the embankment shall be at least 10 percent greater than the designed height to allow for settlement. The maximum settled height shall be 15 feet measured from the natural ground at the centerline of the embankment. Slopes may be vegetated or may be flattened to permit cropping.

Water and sediment control basin cross-sections shall be broad base, narrow base, or grassed backslope as defined for Terraces (600), except that effective top widths shall be as shown above.

Deep Gully Control. Water and sediment control basins may be used to control the advancement of deep gullies if all of the following conditions are met:

1. Uncontrolled drainage area is 20 acres or less and total drainage area is 50 acres or less.
2. Maximum settled fill height is 20 feet measured from the natural ground at the centerline of the embankment.
3. Overall height from top of constructed fill to the point where the toe of fill intersects the exiting gully bottom is not more than 50 feet.

4. The need for embankment and abutment drainage is carefully evaluated.
5. A resource management system is in place for the entire drainage area.
6. One foot of freeboard is added to the required ridge and an auxiliary spillway is provided on one or both ends of the basin.

Capacity. The basin shall be large enough to control the runoff during a 10-year - 24-hour frequency storm without overtopping. The capacity of basins designed to provide flood protection or to function with other structures may be larger and shall be adequate to control the runoff from a storm of a frequency consistent with the potential hazard. The basin also shall have the capacity to store the anticipated 10-year sediment accumulation, unless provisions are made for periodic sediment removal from the basin to maintain the design capacity.

The basins shall have the ends closed to the elevation needed for the design capacity. A maximum of 1 foot of freeboard may be added to the design height to provide for an auxiliary spillway around one or both ends of the basin. The auxiliary spillway must not contribute runoff to a lower basin in series that does not have an auxiliary spillway.

Non-Storage Sections. Water and sediment control basins may be extended as a ridge and channel for short non-storage sections. The grade of the channel shall be as required for terrace channels. The velocity of the channel shall not be erosive when subjected to the peak runoff from a 10-year - 24-hour event.

Outlets. Water and sediment control basins shall have underground outlets or soil infiltration outlets that meet the requirements for Terraces (600) and/or Underground Outlets (620).

Vegetation. Slopes and disturbed areas that are not to be farmed shall be established to suitable erosion-resistant

vegetation. Environmental quantity and wildlife food and habitat shall be considered in selecting the species of vegetation. If soil or climatic conditions preclude the use of vegetative cover and protection is needed, an organic or gravel mulch may be used. Seedbed preparation, fertilizing, seeding, and mulching shall be in accordance with Critical Area Planting (342). Seeding immediately after construction is completed is desirable.

PLANNING CONSIDERATIONS

In highly visible public areas and those associated with recreation, careful considerations should be given to landscape resources. Landforms, structural materials, water elements, and plant materials should visually and functionally complement their surroundings. Excavated material and cut slopes should be shaped to blend with the natural topography. Site selection can be used to reduce adverse impacts or create desirable focal points.

Consider conservation and stabilization of archaeological and historic sites when designing this practice. This practice has the potential of positively and/or negatively affecting National Register listed or eligible (significant) cultural resources. Follow NRCS policy for considering cultural resources during planning, construction, and maintenance.

The drainage area above the structure must be protected against erosion to the extent that expected sedimentation will not shorten its planned effective life.

Fencing should be utilized in areas when necessary to control access by animals or people.

Structures installed in natural watercourses shall be compatible with the fluvial geomorphic conditions at the site to ensure the stability of the structure.

PLANS AND SPECIFICATIONS

Plans and specifications for installing water and sediment control basins shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

OPERATION AND MAINTENANCE

An operation and maintenance job sheet or plan shall be provided for each resource management system and practice. The maintenance plan for a water and sediment control basin shall include maintenance requirements for the embankment, design capacity, vegetative cover, and the outlet.

Maintenance should include inspection of inlets for clogging and embankment failure after each large storm. Damage should be corrected as soon as possible to prevent major failures.

The sediment and design capacity shall be maintained by cleaning the basin or by raising the embankment height. Excavated material spread on the cropland shall be placed to maintain fertility and enhance topography. Fill material for increasing the embankment height shall be obtained in a manner that enhances topography and maintains productivity of the cropland. The vegetation shall be maintained to prevent sheet and rill erosion or gully erosion of the embankment. Trees and woody cover generally create problems on embankments and should be controlled.